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A Study on Highly Cited Engineering Open Access Publications in India with Special reference to Scopus Database

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Abstract

Open access movement enhances the researchers to access good number of resources. The freely available content has created a great impact on accessing many journal articles in various subject disciplines and enriches the academic community with widespread knowledge. The present study attempts to analyze the open access journals and articles listed in the Engineering domain with special reference to Scopus database for the period of 2011-2020 in India. A total of 160 journals and 56,612 journal articles on Engineering domain are listed in Scopus database. 2019 is the highest number of publications 30.78 % during the analyzed period of study.19381 journals were published in computer Science and 91% of the documents were published as research articles. Vellore Institute of Technology is the most predominant institution having more publications in engineering domain. The study results that Making a 'completely blind' image quality analyzer authored by Mittal A., Soundararajan R., Bovik A.C., published in IEEE Signal Processing Letters in 2013 received the highest Time Cited value 1772. The article Modeling and analysis of K-tier downlink heterogeneous cellular networks authored by Dhillon H.S., Ganti R.K., Baccelli F., Andrews J.G. in 2012 created 70.20 FWCI. Department of Science and Technology, Ministry of Science and Technology, India is the predominant funding agency in the field of engineering.

Keywords: Open Access Journals, Scopus, India, Engineering Research Output

I.INTRODUCTION

Open access movement is a boon for the academic community which provides unrestricted, free online access to articles and journals which permit the users to read, download, print, copy, distribute and link to the articles without any financial, lawful and technological barriers. The main objective of open access is to project the intellectual output of the researchers, academicians and institutions more visible, accessible, searchable by any of the potential users over the internet. Open access also eliminates the price barriers such as subscription, licensing and authorization barriers such as copyright and intellectual rights.

Scopus is the abstract and citation database which has coverage of 36377 titles from 1167 renowned publishers in which 34346 peer reviewed journals in the predominant subject area such as Engineering, Life Science, Physical Sciences, Health sciences and Social sciences. It has various numerical qualitative measures such as h-index; cite score, SJR and SNIP.The present study is framed to analyse the open access publications in the engineering domain with special reference to Scopus database in India for the period of 2011-2020.

II.REVIEW OF LITERATURE

Walter (2011) attempted to study the attributes of 663 Open Access (OA) journals in biology, computer science, economics, history, medicine, and psychology and resulted that 29% of Open Access journals charge publication fees. Moreover OA journals in the fields of biology and medicine are larger than that of the others and the OA journal has the high degree of influence by a few key publishers and journals

Loan, Rather and Shah (2008) conducted a study on Indian contribution to open access literature based on DOAJ and open DOAR and resulted that the position of India with respect to number of journals in the Directory of Open Access Journals (DOAJ) is seventh across the world .

III.SCOPE AND OBJECTIVE

The study focuses on the Articles and journals on Engineering available in the Scopus database as on 15 September 2021. The major objective of the study is as follows

- To find out the number of Journals and Journal Articles available on Engineering domain in Scopus
- To figure out the year wise contribution of journal articles added on Engineering domain in Scopus
- To find out the document type distribution of publications
- To analyze the subject category of journals in Scopus
- To find out the language of journals , Sources, on Engineering in Scopus
- To analyze the predominant institutions, and Collaborative Countries
- To figure out the funding agencies for open access publications in Scopus
- To analyze the predominant author of publications in Scopus
- To analyze of publication characteristics such as Citation counts, Source titles, and Core research areas and
- To find out the Field weight citation Impact (FWCI) of the top cited articles on engineering

IV.METHODOLOGY

Scopus is a renowned citation database which provides the research impact and visibility of the author , Institution and the impact of the research work on specific subject domain available at www.scopus.com (as on 15th September 2021) has been used as the data source. A total of 160 journals and 56612 publications were extracted on engineering in India for the period of 2011-2020. Data collected were imported to Excel and biblioshiny to achieve the objective of the framed study.

V.RESULTS AND DISCUSSION

JOURNAL VS ARTICLE

TABLE 1: JOURNAL VS ARTICLES

Sl. No	Type of Source	OUTPUT
1.	Journals	160
2.	Articles	56,612

Table 1 shows that 160 journals and 56,612 journal articles on Engineering domain are listed in Scopus database.

GROWTH OF PUBLICATIONS

TABLE 2: YEAR WISE DISTRIBUTION

Sl. No	Year	No of Publications	Percentage (%)
1.	2011	1092	1.93
2.	2012	1843	3.26
3.	2013	1963	3.47
4.	2014	2738	4.84
5.	2015	3134	5.54
6.	2016	4101	7.24
7.	2017	5023	8.87
8.	2018	8884	15.69
9.	2019	17428	30.78
10.	2020	10406	18.38
	TOTAL	56612	100

Table 2 shows that a majority of 17428 Journal articles are added to Scopus in 2019, followed by 8884 publications in 2018. 5023 articles in 2017 and 4101 articles in 2016. While 3134 articles were added in 2015, 2738 articles were added in 2016.

DOCUMENT TYPE DISTRIBUTION

FIGURE 1: DOCUMENT TYPE DISTRIBUTION

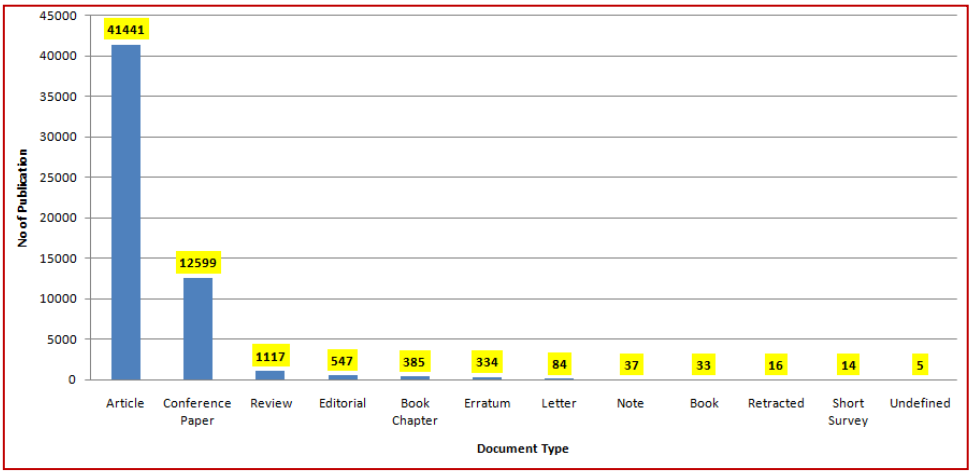


Figure 1 shows the document type distribution of publications. It is evident that the top cited research has been published as articles, review; Conference paper, Note, Editorial and book. The majority of the publications are research articles (41441).

SUBJECTWISE DISTRIBUTION

FIGURE 2: SUBJECT WISE INCLUSION OF ARTICLES

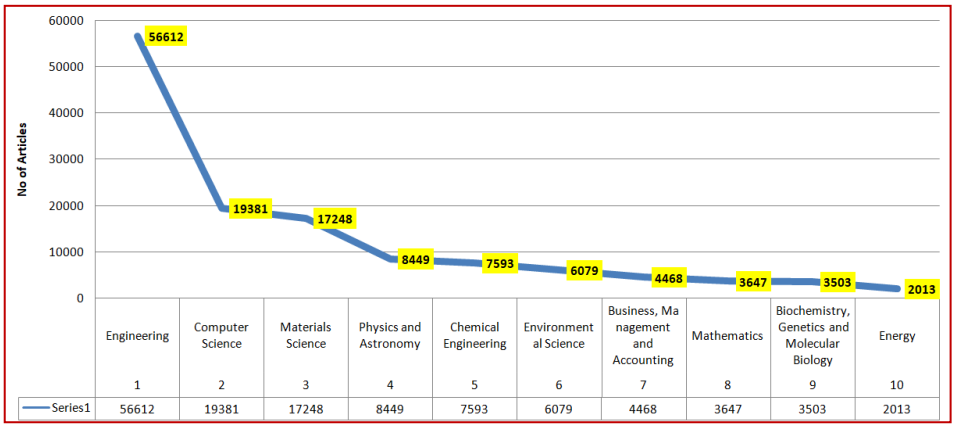


Figure 2 shows the subject wise inclusion of articles. It is clear that out of 56612 articles on Engineering, 19381 journals have articles on Computer Science, 17248 Materials Science, Physics and Astronomy 8849.

LANGUAGESWISE PUBLICATIONS

Figure 3: Languages Wise Articles

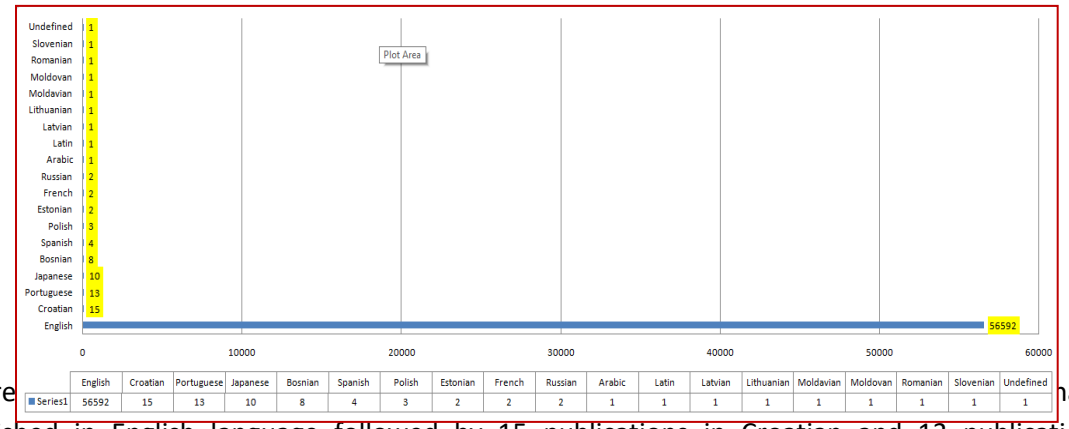


Figure [illegible] nals are published in English language followed by 15 publications in Croatian and 13 publications in Portuguese, 10 in Japanese.

PREDOMINANT SOURCES

FIGURE 4 PREDOMINANT SOURCES OF PUBLICATIONS

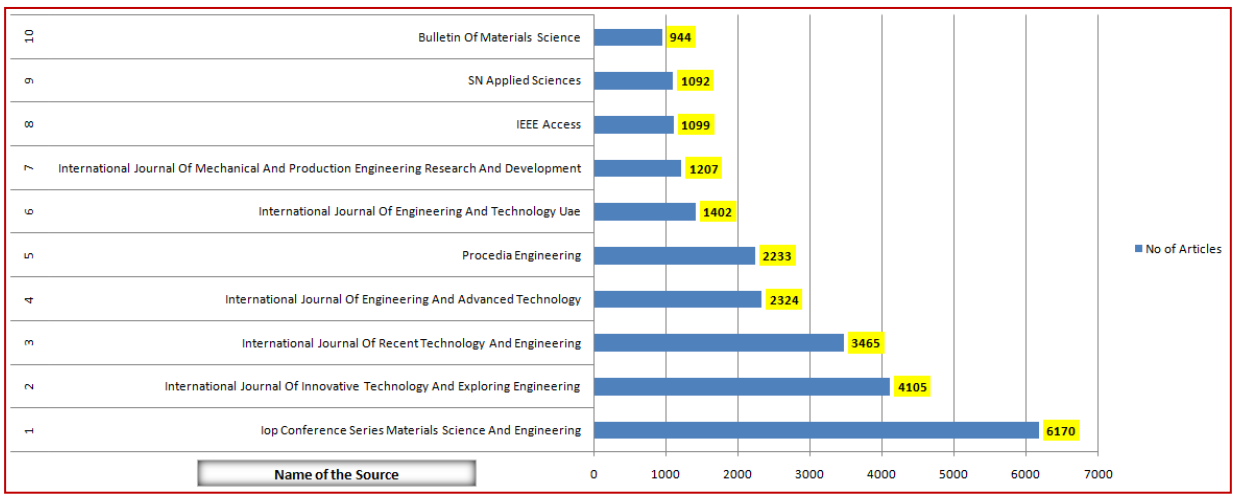
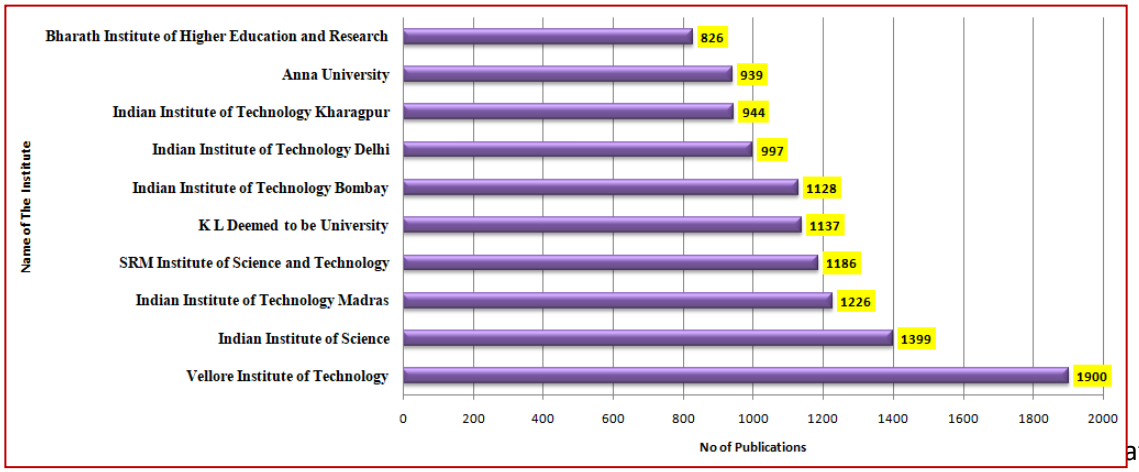


Figure 4 shows that 'IOP conference series Materials science and engineering" is the predominant source of publication with 6170 publications followed by 'International Journal of Innovative Technology and Exploring Engineering' with 4105 articles , International Journal of Recent Technology and Engineering with 3465 articles and International Journal of Engineering and Advanced Technology with 2324 articles.

PREDOMINANT INSTITUTIONS

FIGURE 5: MOST PRODUCTIVE INSTITUTIONS



atabase. Vellore Institute of Technology has 1900 publications followed by Indian Institute of Science (1399), Indian Institute of Technology, Madras. It is clear that part of IITs Private technical higher education institutions are publishing more in the domain of engineering. Tamilnadu has 5 most productive institutions during the study period. Other positions were shared by the Indian Institute of Technology (IITs) and Indian Institute of Science.

PREDOMINANT COLLABORATIVE COUNTRIES

FIGURE 6: COLLABORATIVE COUNTRIES ON ENGINEERING

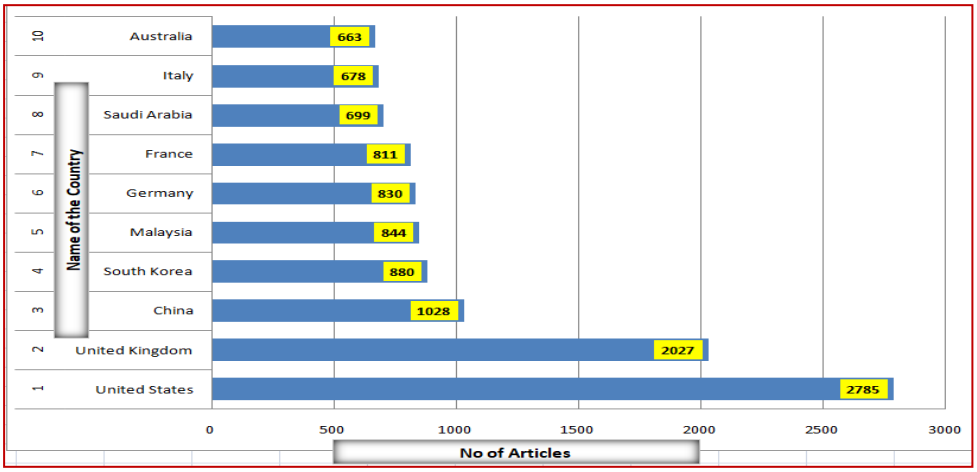


Figure 6 clearly shows that there are 2785 journals articles were collaborated with United States followed by 2027 United Kingdom, China 1028, South Korea, Malaysia and Germany have 880, 844, and 830 respectively.

PREDOMINANT FUNDING AGENCIES

TABLE 3: TOP 10 FUNDING AGENCIES

Sl. No	Funding Agencies	No of Publications
1.	Department of Science and Technology, Ministry of Science and Technology, India	1741
2.	Science and Engineering Research Board	775
3.	Department of Science and Technology, Government of Kerala	686
4.	Council of Scientific and Industrial Research, India	664
5.	National Science Foundation	618
6.	University Grants Commission	618
7.	National Natural Science Foundation of China	428
8.	European Commission	365
9.	U.S. Department of Energy	363
10.	National Research Foundation of Korea	359

Table 3 shows the predominant funding agencies for engineering as reflected in Scopus database. Department of Science and Technology, Ministry of Science and Technology, India is the predominant funding agency for engineering publications in India (1741) followed by Science and Engineering Research Board (775) and Department of Science and Technology, Government of Kerala (686).

PREDOMINANT AUTHORS

FIGURE 7: PREDOMINANT AUTHORS ON ENGINEERING

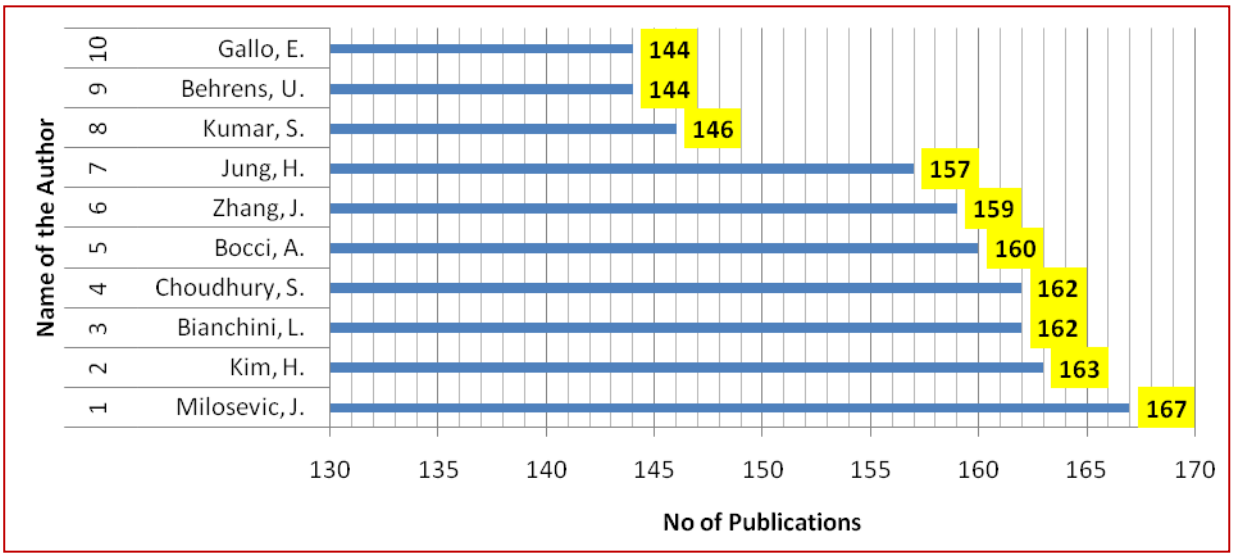


Figure 7 shows the predominant authors on engineering domain reflected in Scopus database. It is evident that Milosevic, J with 167 publications followed by Kim, H (163) each. It is found that Bianchini, L with 162 publications.

PREDOMINANT ARTICLES

TABLE: 4 TOP TEN ARTICLES WITH HIGHEST CITATIONS

Sl. No	Title	Year	Source title	Cited by
1	Making a 'completely blind' image quality analyzer	2013	IEEE Signal Processing Letters	1772
2	Advanced control architectures for intelligent microgridspart i: Decentralized and hierarchical control	2013	IEEE Transactions on Industrial Electronics	1299
3	A Survey of 5G Network: Architecture and Emerging Technologies	2015	IEEE Access	1285
4	Modeling and analysis of K-tier downlink heterogeneous cellular networks	2012	IEEE Journal on Selected Areas in Communications	1197
5	Nano based drug delivery systems: Recent developments and future prospects	2018	Journal of Nanobiotechnology	947
6	Jaya: A simple and new optimization algorithm for solving constrained and unconstrained optimization problems	2016	International Journal of Industrial Engineering Computations	875
7	Internet of things: Applications and challenges in technology and standardization	2011	Wireless Personal Communications	862
8	Real-time status: How often should one update?	2012	Proceedings - IEEE INFOCOM	699
9	Are we ready for SDN? Implementation challenges for software-defined networks	2013	IEEE Communications Magazine	698
10	Advanced control architectures for intelligent micro grids Part II: Power quality, energy storage, and AC/DC micro grids	2013	IEEE Transactions on Industrial Electronics	668

Table 4 identifies the details of top 10 articles with highest citation count as reflected in Scopus database. An article titled ‘Making a 'completely blind' image quality analyzer authored by Mittal A., Soundararajan R., Bovik A.C., published in IEEE Signal Processing Letters in 2013 received the highest Time Cited value 1772 followed by ‘Advanced control architectures for intelligent micro grids part I: Decentralized and hierarchical control 2013’ authored by Guerrero J.M., Chandorkar M., Lee T.-L., Loh P.C., in 2013 received 1299 total citations. The Time Cited value gives the “number of articles in the database that cite the current article”. The number of citations received by considered articles is in the range from 1772 to 668.

PREDOMINANT ARTICLES WITH FIELD WEIGHT CITATIONS IMPACT

TABLE 5: ARTICLES WITH FIELD WEIGHT CITATIONS IMPACT

Sl. No	Title	Year	Source title	FWCI
1	Modeling and analysis of K-tier downlink heterogeneous cellular	2012	IEEE Journal on Selected Areas in Communications	70.20

	networks			
2	Making a 'completely blind' image quality analyzer	2013	IEEE Signal Processing Letters	47.60
3	Jaya: A simple and new optimization algorithm for solving constrained and unconstrained optimization problems	2016	International Journal of Industrial Engineering Computations	43.34
4	Nano based drug delivery systems: Recent developments and future prospects	2018	Journal of Nanobiotechnology	37.39
5	Advanced control architectures for intelligent microgridsPart II: Power quality, energy storage, and AC/DC microgrids	2013	IEEE Transactions on Industrial Electronics	32.00
6	Are we ready for SDN? Implementation challenges for software-defined networks	2013	IEEE Communications Magazine	31.56
7	Internet of things: Applications and challenges in technology and standardization	2011	Wireless Personal Communications	29.95
8	A Survey of 5G Network: Architecture and Emerging Technologies	2015	IEEE Access	28.64
9	Advanced control architectures for intelligent microgridspart i: Decentralized and hierarchical control	2013	IEEE Transactions on Industrial Electronics	24.12
10	Real-time status: How often should one update?	2012	Proceedings - IEEE INFOCOM	4.94

Table 5 demonstrates the details of top ten articles with highest Field weight citation Index (FWCI). An article titled Modeling and analysis of K-tier downlink heterogeneous cellular networks authored by Dhillon H.S., Ganti R.K., Baccelli F., Andrews J.G. in 2012 FWCI value of 70.20 followed by the article titled “Making a 'completely blind' image quality analyzer” authored by Mittal A., Soundararajan R., Bovik A.C. 2013 received the Field weight citation impact of 47.60.

VI. CONCLUSION

Open access platform opens the eyes of researchers to promote the research visibility and create the impact in world level literature. Scopus is the one of the citation database which serves very well for the engineering to enhance the research output exclusive in the global arena. This study brings out an overview about the open access publications in the domain of engineering in India with special reference to Scopus database. Open access publication helps the peer group to find out the right source of publications and to avoid the predatory journals. It also helps to improve research impact and citation analysis.

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